

## *Erethistoides senkhiensis*, a new catfish (Teleostei: Erethistidae) from India

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*Erethistoides senkhiensis*, new species, is described from Senkhi stream, Arunachal Pradesh, India. It differs from all congeners except *E. infuscatus* in having a less strongly produced snout. It differs from *E. infuscatus* in having the body with three black to light brown cross bars on a dark grey to light brown background, fewer vertebrae (29-30) and a concave caudal-fin, in having the serrae on the posterior edge of the pectoral spine short, more convex anteriorly and distantly placed.

### Introduction

Erethistidae is a family of catfishes that inhabits South and Southeast Asia. Members of this family are small, cryptically colored fishes with tuberculate skin and well developed coracoid process (Ng, 2005). Members of the genus *Erethistoides* are small and poorly known, originally diagnosed from other erethistid genera in having a tuberculate skin a greatly depressed head and body (Hora, 1950). As a result of the discovery of additional species in the recent years (Ng, 2005) the genus was re-diagnosed by two unambiguous synapomorphies, i.e. the neural spines of the first eight post-weberian vertebrae strongly depressed, inflected posteriorly, and positioned in a groove formed by the base of the neural spines of the vertebrae immediately posterior; an enlarged maxilla that is almost as long as the palatine. The

genus now includes six species: *E. montana*, *E. pipri*, *E. sicula*, *E. cavatura*, *E. ascita* and *E. infuscatus*. They are known from India, Nepal and Bangladesh.

The specimen of *Erethistoides* collected during ichthyological surveys in Arunachal Pradesh include an undescribed species, which is described here as *E. senkhiensis*.

### Material and methods

Measurements were taken point to point with digital callipers and data recorded to tenths of a millimetre. Counts and measurements were made on the left side of specimens whenever possible except the count of serrae on anterior margin of pectoral spine, which was taken on both spines. Measurements follow those of Ng & Dodson

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(1999) and for narial complex Ng (2005). Subunits of the head are presented as proportions of head length (HL). Head length and measurements of body parts are given as proportions of standard length (SL). The length of the narial complex is given as proportions of interorbital distance. Vertebrae were counted on five individuals (32.2-43.4 mm SL) after removing flesh with needle and scalpel. Values in brackets after a given count indicate the number of specimens with that count. Asterisks indicate the values of the holotype.

Abbreviations used: UMMZ, University of Michigan, Museum of Zoology, Ann Arbor; ZSI, Zoological Survey of India, Kolkata. Data on *E. sicula*, *E. cavatura*, *E. ascita* and *E. infuscatus* were obtained from the literature (Ng, 2005, 2006; Ng & Edds, 2005) and from photographs of the holotype of *E. infuscatus*.

***Erethistoides senkhiensis*, new species**  
(Fig. 1)

**Holotype.** ZSI FF 4049, 38.8 mm SL, female; India: Arunachal Pradesh: Senkhi stream, at Itanagar; 27°04'29"N 93°30'52"E, 173 m asl; L. Tamang, 6 Jun 2006.

**Paratypes.** ZSI FF 4050, 8, 33.7-40.0 mm SL; India: Arunachal Pradesh: Senkhi stream, near to confluence point with Chimpu stream, Itanagar; L. Tamang, 14 Dec 2005-5 May 2006. – ZSI FF 4051, 4, 36.0-37.2 mm SL; India: Arunachal Pradesh: Senkhi stream; L. Tamang, 5 Mar-26 Jun 2006. – ZSI FF 4052, 5, 32.2-43.4 mm SL (skeleton); India: Arunachal Pradesh: Senkhi stream; L. Tamang, 21 Jun to 15 Aug, 2007.

**Diagnosis.** *Erethistoides senkhiensis* is distinguished from *E. infuscatus* in having three black to light brown cross bars on a dark grey to light brown body background (vs. brown body, sometimes with a few indistinct pale patches). *Erethistoides senkhiensis* differs from *E. infuscatus* in having fewer vertebrae 29-30 (vs. 31-33), in having the caudal-fin concave (vs. forked), in having more serrae on the anterior margin of the pectoral spine (18-29 vs. 7-19), and in having the serrae of the posterior edge of the pectoral spine short, more convex anteriorly and distantly spaced (see Figure 2).

*Erethistoides senkhiensis* is distinguished from the other species of the genus in having the snout

not overhanging (vs. overhanging). *Erethistoides senkhiensis* differs from both *E. montana* and *E. pipri* in having a shorter pectoral spine (21.7-27.9 % SL vs. 30.7-32.1); from *E. pipri* in having a broader head (width 20.0-24.3 % SL vs. 16.4); from *E. sicula* by the absence (vs. presence) of a light median depression on the lower lip margin and by having a deeper caudal peduncle (depth 5.9-8.1 % SL vs. 4.1-5.1), and from *E. ascita* and *E. cavatura* in having a shorter head (length 24.3-27.3 % SL vs. 27.7-31.6), and a deeper body (depth at anus 11.7-16.4 % SL vs. 8.6-10.5).

**Description.** Morphometric data for holotype and paratypes are provided in Table 1. Head V-shaped when viewed dorsally, depressed, broader at pectoral-fin origin. Top of head with number of bony ridges and covered with round and ovoid tubercles. Supraoccipital spine well developed and not reaching nuchal shield and located at middle of posttemporo-supracleithrum process. Posttemporo-supracleithrum mostly straight and sometime gently turned outwardly towards tip. Nuchal shield usually fan-shaped but wing shape in holotype. Median longitudinal groove on head well developed, anterior tip reaching anterior nares and posterior tip reaching base of supra-occipital spine.

Eye slightly longer than broad and not visible ventrally, located dorsolaterally and in posterior half of head.

Mouth small, inferior. Lips sparsely papillate. Upper lip continuous with maxillary barbel. Upper jaw slightly overhanging lower jaw. Snout fleshy and thick. Lower lip margin without median depression. Oral teeth small and in irregular rows on all tooth-bearing areas. Premaxillary tooth band with patches of minute teeth and partially visible when mouth is closed. Branchiostegals 6. Four pairs of barbels, nasal, maxillary, and outer and inner mandibular. Maxillary barbel with slightly broad flap at base; slender towards end and less flat, extending almost posterior end of pectoral base. Anterior margin of maxillary barbel with rough granulated tubercles in base region. Outer mandibular barbel reaching to or near to pectoral-fin origin. Inner mandibular barbel shorter and reaching to or slightly beyond isthmus. Nasal barbel triangular and very short.

Body broader at anterior part of dorsal-fin origin and gently compressing towards caudal peduncle. Maximum body depth at dorsal-fin

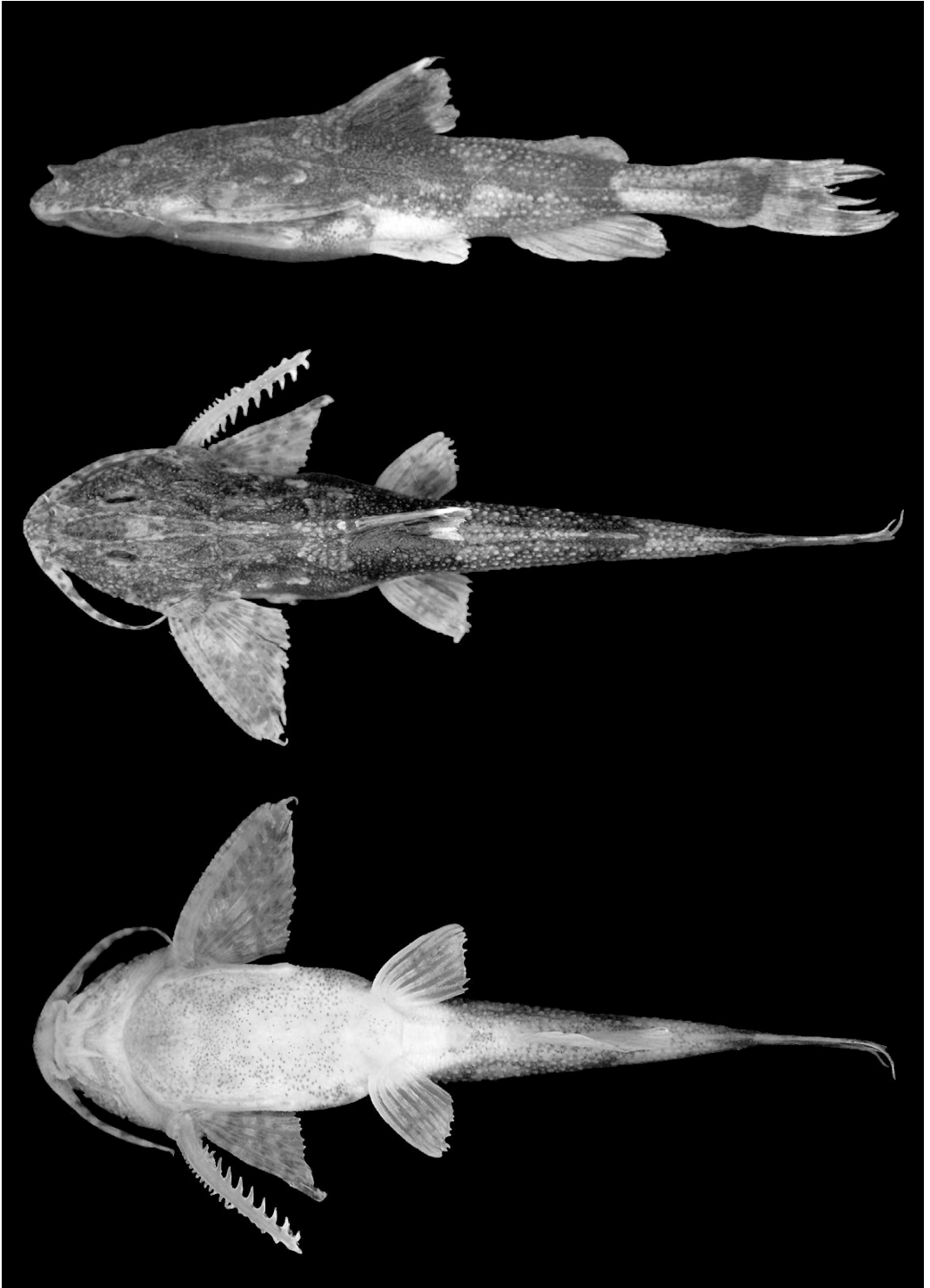


Fig. 1. *Erethistoides senkhiensis*, ZSI FF 4049, holotype, 38.8 mm SL, female; India: Senkhi stream.

origin. Dorsal outline of body evenly rising to dorsal-fin origin and then decreasing towards caudal peduncle. Ventral surface flat to pelvic-fin base, then rising gently towards caudal peduncle. Skin thin, with 5-8 rows of tubercles along body dorsally and laterally. Lateral line complete and mid-lateral, passing just below posttemporo-supracleithrum process to caudal base. Abdomen flat and loose (except egg bearing), tuberculate. Vertebrae 29-30.

Dorsal-fin with 5(14)\* and 6(4) rays. Dorsal-fin spine strong and almost straight, anterior margin of spine minutely granulated near base in some mature individuals; posterior margin smooth in largest individuals and sometime with 3-4 small granulation feebly developed.

Pectoral fin strong, with sharply pointed tip, with 6 rays. Anterior margin with 12-29 strong

serrae along entire length. Serrae on anterior margin irregular; 13 individual with antrorse serrae; 16 individuals with diverging serrae (2-8 retrorse serrae, 12-27 antrorse); and 1 individual with 2 bifurcate serrae and remaining retrorse and antrorse. Posterior spine margin with 9(12)\* and 10(6) strong serrae along entire length; serrae short, convex anteriorly and distantly placed to each other. Pectoral-fin margin slightly convex in most specimens. Pectoral girdle with long coracoid process, well developed and externally visible; tip of process reaching approximately 2/3 of distance between posterior extremity of pectoral-fin base and pelvic-fin origin. Paired fins not plaited.

Pelvic-fin origin at vertical through middle of dorsal-fin base. Pelvic-fin with 5(7) and 6(11)\* rays and slightly convex margin; tip of adpressed

**Table 1.** Morphometric data for *Erethistoides senkhiensis* (n=18).

	holotype	range	mean±SD
Standard length	37.9	32.2-43.4	37.1±2.9
<b>In percent of standard length</b>			
Predorsal length	43.1	37.4-43.1	39.6±1.6
Preanal length	68.5	61.1-69.9	66.3±2.2
Prepelvic length	47.5	43.7-54.1	47.1±2.8
Prepectoral length	23.8	21.0-25.5	23.5±1.0
Length of dorsal-fin base	13.1	10.7-16.3	14.4±1.3
Length of dorsal-spine	16.0	13.3-22.0	16.7±2.4
Length of anal-fin base	17.0	12.6-17.0	14.9±1.3
Pelvic-fin length	16.0	14.8-19.0	16.9±1.5
Pectoral-fin length	28.1	22.3-32.5	27.2±2.5
Pectoral-spine length	25.1	21.7-27.9	25.4±1.7
Caudal-fin length	23.6	21.1-26.8	23.6±1.3
Length of adipose-fin base	13.4	9.6-20.9	15.5±2.9
Dorsal-fin to adipose-fin distance	13.4	9.9-17.5	14.0±2.4
Post-adipose distance	21.3	17.3-22.5	20.6±1.5
Length of caudal peduncle	17.8	16.6-23.0	19.8±1.6
Depth of caudal peduncle	5.9	5.9-8.1	6.9±0.6
Body dept at anus	13.8	11.7-16.4	14.0±1.2
Head length	27.3	24.3-27.3	25.4±0.9
Head width	22.9	20.0-24.3	22.0±1.2
Head depth	13.9	12.4-15.5	13.9±0.9
<b>In percent of head length</b>			
Snout length	52.2	45.3-54.2	50.1±2.4
Interorbital distance	27.9	24.4-36.3	31.5±2.8
Eye diameter	15.6	13.7-21.0	17.1±2.3
Nasal barbel length	11.7	9.2-20.9	12.3±2.7
Maxillary barbel length	91.3	80.0-108.0	91.9±6.8
Inner mandibular barbel length	31.8	26.7-43.7	34.3±5.1
Outer mandibular barbel length	50.0	38.3-60.5	49.1±5.5
<b>In percent of interorbital distance</b>			
Length of narial complex	82.8	60.0-88.1	73.4±7.3

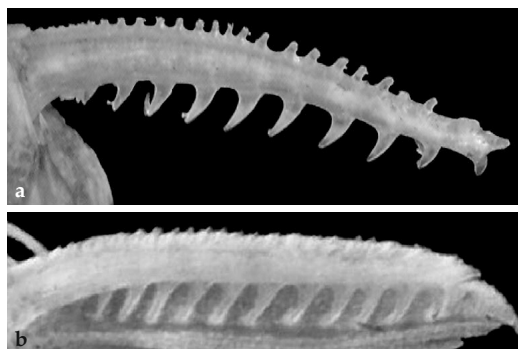


Fig. 2. Ventral view of serration of posterior edge of pectoral spine of: **a**, *Erethistoides senkhiensis*, ZSI FF 4051, 36.0 mm; and **b**, *E. infuscatus*, UMMZ 245695, 39.0 mm SL.

fin nearly reaching anal-fin origin. Anus located at two-thirds of distance between pelvic and anal-fin origins.

Adipose-fin base variable (length 9.6-20.9 % SL) and deeply incised posteriorly. Anal-fin with 9(12) and 10(6)\* rays and slightly curved margin.

Caudal-fin concave (Fig. 3); upper and lower lobes narrow and pointed, with lower lobe slightly longer than upper. Principal rays i,6,6,i(2); i,6,7,i(1); i,7,7,i(6); i,8,6,i(1); i,8,8,i(6)\* or i,9,6,i(2). Procurent rays 9,7(2); 11,7(6); 9,8(4)\*; 6,8(2) or 8,7(4) rays on upper and lower margin, respectively.

Distance between pectoral-fin base and origin of pelvic-fin equal to distance between origin of pelvic-fin and anal-fin base. Length of dorsal-fin base almost equal to anal-fin base. Length of anal-fin almost equal to length of caudal-fin. Head width equal to prepectoral length and length of median longitudinal groove. Interorbital distance almost equal to length of narial complex.

**Coloration.** In life, dorsum of head marmorated with black, cream and light brown. Head and body light brown laterally. Dorsally, a light black mark under skin in between eyes in middle of longitudinal groove. Black, brown and pale greyish tubercles on head, along flank and lateral line. Body with three black to light brown cross bars: first from dorsal-fin base downwards, second from adipose-fin downwards, third on anterior half of caudal peduncle (faint in holotype). Some individual with bands joining homologous bars



Fig. 3. Caudal fin of: **a**, *Erethistoides senkhiensis*, ZSI FF 4051, 36.0 mm SL; and **b**, *E. infuscatus*, UMMZ 245000, 39.0 mm SL.

on other side along dorsal midline. Eye bronze colored above horizontal axis and very light greyish below. Light shiny copper dorsally or just above lateral line on body. Dorsal and adipose-fin black to light brown and hyaline at tip. Pectoral, pelvic and anal fins hyaline, with scattered melanophores, more in pectoral, less in pelvic and least in anal-fin rays; membranes almost hyaline. Caudal-fin hyaline or dirty white in some specimens, with subdistal light brown marks. Maxillary barbel annulated with 7-14 brown rings; outer and inner mandibular barbels almost cream but sometime feebly brown rings present in outer one. Abdomen cream to dirty white and light yellow sometime; dense round creamy tubercles in addition to minute black and light brown irregular spot marking.

In formalin, head grey, light brown, cream and black dorsally and laterally. Rows of tubercles along body light cream. Body chocolate brown above lateral line, and dirty white below. Ventral surface of head and body cream or dirty cream to faint yellowish sometimes. Anterior margin of maxillary barbel creamy.

**Distribution.** Known from the confluence of Senkhi and Chimpu streams at Itanagar, Arunachal Pradesh, India. The Senkhi stream meets with Dikrong River in the south; the Dikrong River itself is a tributary of the Brahmaputra River in Assam.

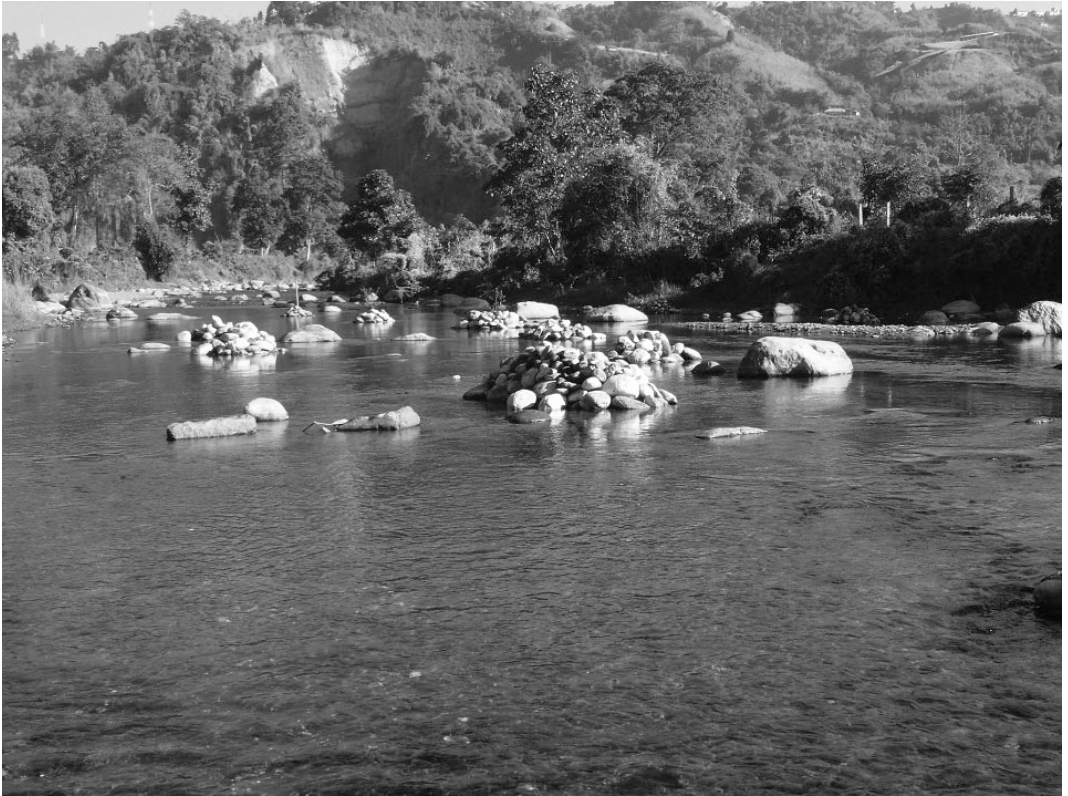


Fig. 4. Senkhi stream at Itanagar, Arunachal Pradesh, India, type locality of *Erethistoides senkhiensis*.

**Ecological notes.** *Erethistoides senkhiensis* was collected by a 3 m diameter cast net with 8 mm meshes, in low depth (15–35 cm), moderately clear water as well as in turbid running water with pebbles, cobbles, concrete of variable colors and sand particles. Other species found at the same locality were: Cyprinidae: *Opsarius bendelisis*, *O. barna*, *Barilius barila*, *Garra gotyla*, *G. annandalei*, *Puntius ticto*, *Tor tor*, *Aspidoparia morar*, *Chagunius chagunio*, *Crossocheilus latius*, *Neolissochilus hexagonolepis*, *Semiplotus semiplotus*; Erethistidae: *Pseudolaguvia shawi*; Amblycipitidae: *Amblyceps mangois*; Psilorhynchidae: *Psilorhynchus balitora*; Balitoridae: *Balitora brucei*, *Acanthocobitis botia*, *Aborichthys elongatus*, *Schistura savona*; Ambassidae: *Chanda nama*.

**Etymology.** Named for Senkhi stream (the type locality). An adjective.

## Discussion

The new species is placed in *Erethistoides* on the basis of the presence of two unambiguous synapomorphies described by Ng (2005), i.e. the neural spines of the first eight post-weberian vertebrae strongly depressed, inflected posteriorly, and positioned in a groove formed by the base of the neural spines of the vertebrae immediately posterior; and an enlarged maxilla that is almost as long as the palatine. Earlier the diverging serration pattern on the anterior margin of the pectoral spine and an overhanging snout were considered diagnostic but Ng (2006) showed that this is not the case because these characters are absent in *E. infuscatus* which otherwise has the synapomorphies of *Erethistoides*. Similarly, in our specimen too, the serration of the anterior margin of the pectoral spine is variable. This character is hereby also considered invalid to diagnose the genus. *Erethistoides senkhiensis* is closely resembles *E. infuscatus* in its less strongly produced snout,

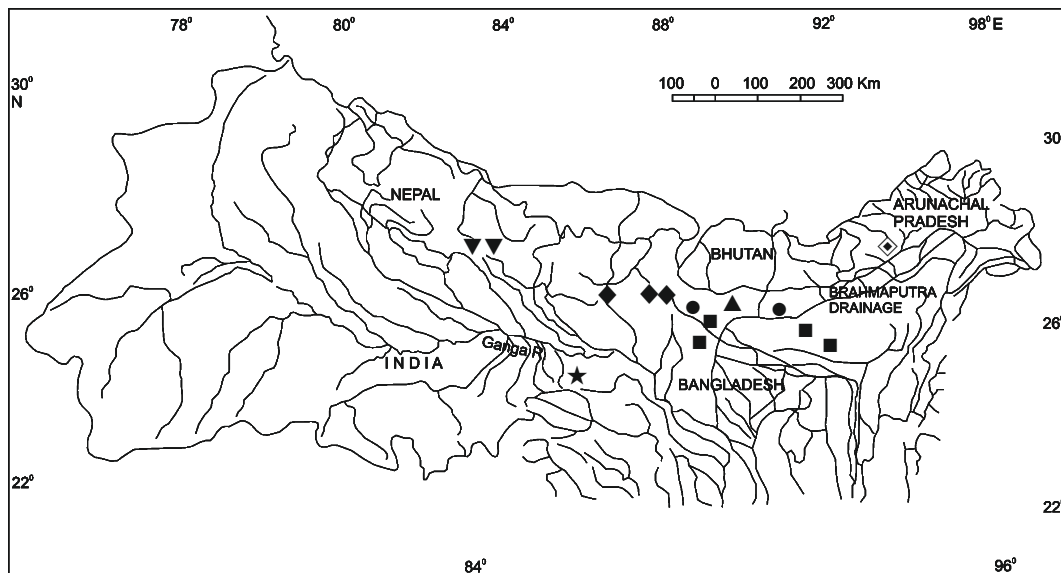


Fig. 5. Distribution of *Erethistoides senkhiensis* (◆), *E. montana* (●), *E. pipri* (★), *E. sicula* (▲), *E. ascita* (◆), *E. cavatura* (▼) and *E. infuscatus* (■).

but differs in body coloration, caudal-fin shape as well as in the shape and location of the serrae on the posterior edge of the pectoral spine.

**Comparative material.** *Erethistoides montana*, ZSI F314/2, holotype, 37.3 mm SL; India: Assam, Darrang district, streamlets around Tangla. *Erethistoides pipri*, ZSI F315/2, holotype, 30.5 mm SL; India: Uttar Pradesh, Mirzapur district, Rihand River at Pipri.

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### Literature cited

- Hora, S. L. 1950. Siluroid fishes of India, Burma and Ceylon. XIII. Fishes of the genera *Erethistes* Muller and Troschel, *Hara* Blyth and of two new allied genera. Records of the Indian Museum, 47: 183-202.
- Ng, H. H. & D. R. Edds. 2005. Two new species of *Erethistoides* (Teleostei: Erethistidae) from Nepal. Ichthyological Exploration of Freshwaters, 16: 239-248.
- Ng, H. H. & J. J. Dodson. 1999. Morphological and genetic descriptions of a new species of catfish, *Hemibagrus chrysops*, from Sarawak, East Malaysia, with an assessment of phylogenetic relationships (Teleostei: Bagridae). Raffles Bulletin of Zoology, 47: 45-57.
- Ng, H. H. 2005. *Erethistoides sicula*, a new catfish (Teleostei: Erethistidae) from India. Zootaxa, 1021: 1-12.
- 2006. *Erethistoides infuscatus*, a new species of catfish (Teleostei: Erethistidae) from South Asia. Ichthyological Exploration of Freshwaters, 17: 281-287.

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